CONSTRUCTION OF A TRANSATLANTIC RECEIVING SET

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Part I.—The Long Wave Receiving Transformer

Editor's Note: Mr. Pacent is in charge of the Radio Department of the Manhattan Electrical Supply Company of New York City and needs no introduction to the host of keen radio enthusiasts in the vicinity. His present offering is the first of a series of constructive articles on modern radio receiving apparatus.

THE work of Mr. E. H. Armstrong of Columbia University has proved to Radio Engineers that the audion produces oscillating currents in the wing circuit rather than a unidirectional current. By tuning the circuit so that the amplitude of the oscillations was greatly increased, they were found to react upon the grid and regenerate a larger current. The response in the telephone receivers was amplified accordingly. Operators who use receivers employing these circuits, with constants properly calculated, have little difficulty in picking up

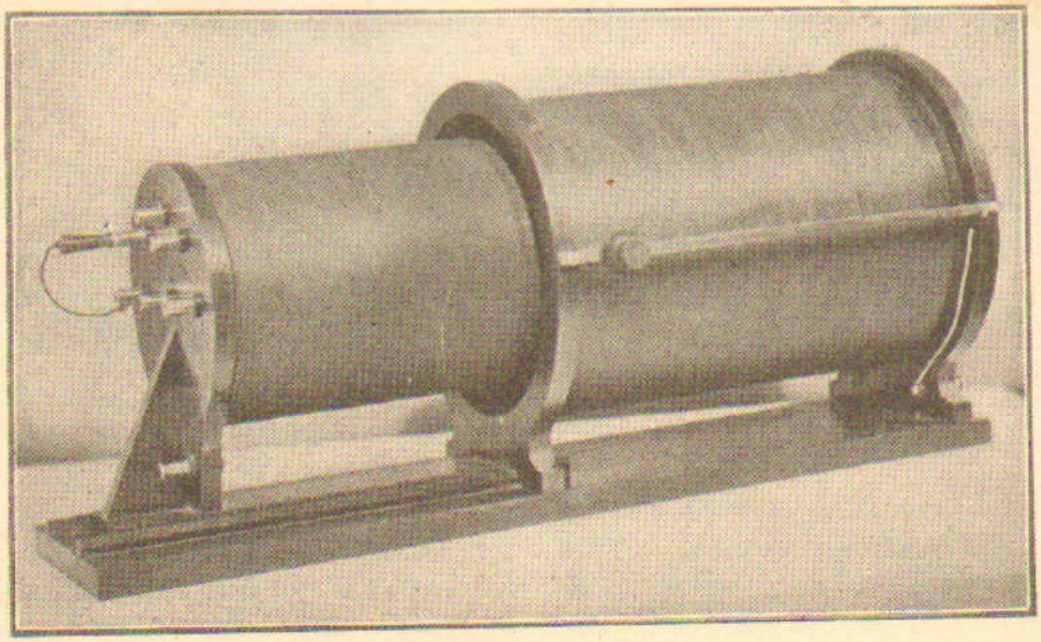


Fig. 1. The long wave receiving transformer as it appears when finished

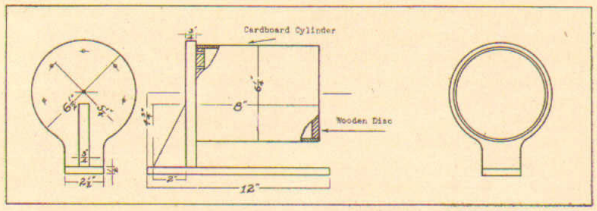


Fig. 5. Details of the secondary

glued into the heads before the winding is done. The solid head may then be secured to the face-plate of a lathe and the winding conveniently done in this manner. If no lathe is available, the worker may use the simple form of winding device described in the "Induction Coil" article in this issue. The end of the winding near the solid head is connected with a binding post, the screw of which is shown in Fig. 1 beneath the coil. The other end is left free as the slider completes the circuit to the second binding post, varying the turns in use as desired.

The primary heads or supports are secured to a wooden base 22¼ in. long and 6 in. wide. Two rails of wood ½ in. square, are nailed to the base and spaced 2½ in. apart, as shown in the end elevation. These rails are 12 in. in length and they therefore pass beneath the head through the slot shown in the drawing.

The secondary is wound in a single layer of No. 27 S.S.C. magnet wire upon a cardboard cylinder 6¼ in. in diameter and 8 in. long. The details are given in Fig. 5. This cylinder is fitted with heads consisting of discs of wood turned to make a tight fit and then glued in place. The winding is done in the usual manner, and the only word of caution is to warn the builder to refrain from permanently fastening the outer disc into the cylinder until the connections from the secondary taps are made. These taps are taken at five points in the winding, each wire being passed through the wall of the cylinder and connected to its proper terminal inside the cylinder. The plug connector is of the usual type and its construction is clearly shown in the photographs.

One end of the winding is connected with a binding post in the supporting head. The other end is connected with the fifth

contact post. The taps go, of course, to the intermediate posts. The central post, to which the plug is connected with cables, is connected with the second binding post.

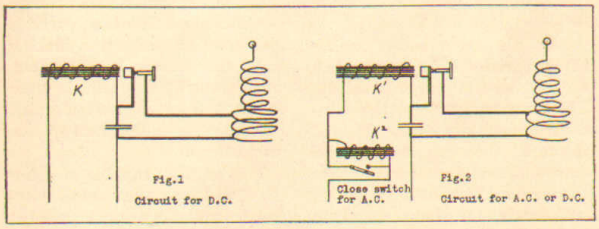
The construction of the upright for the secondary is clearly shown in the drawings and the photographs. The base portion slides between the rails on the main base, passing beneath the primary support when the secondary coil is within the primary.

The finish of the woodwork is, of course, optional with the individual. The model illustrated is stained a weathered oak and finished with wax. This color harmonizes well with the green silk covering of the wire. The latter is given several coats of shellac, each coat being permitted to dry thoroughly before the next is applied.

THE CONSTRUCTION OF KICKING COIL HIGH FREQUENCY APPARATUS

By The Laboratory Staff

THE possibilities of the "kicking coil" type of high frequency apparatus have long been recognized by manufacturers of electro-therapeutic outfits but, doubtless owing to the scarcity of published data on the subject, this simple and inexpensive generator of high frequency currents has not seemed to come in for its due share of popularity among amateur constructors.



Figs. 1 and 2. Wiring diagrams for the kicking coil apparatus

The kicking coil is an oddity to the uninitiated electrical worker; it is merely a winding of comparatively coarse copper

European stations in which either damped or persistent waves are employed.

The object of this series of articles is to describe in detail the construction of an ultra-sensitive receiving set employing the Armstrong circuits. This set, when properly constructed, will not only hear transatlantic stations but also stations located on the Pacific Coast and in Honolulu and vicinity.

Assuming that the prospective builder has an aerial 30 ft. or more in height and 500 ft. long, the receiving transformer to be described will respond to wavelengths of from 1500 to 15,000 meters. The general appearance of the completed transformer is well shown in Fig. 1. Fig. 2

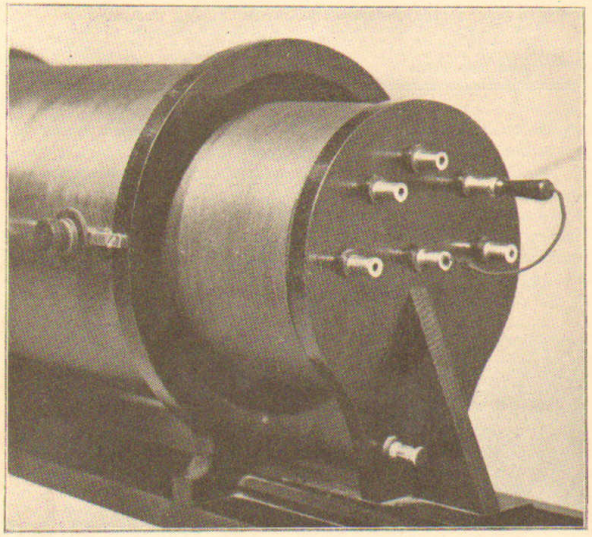


Fig. 2. Enlarged view, showing primary slider and the plug contact device which varies the inductance of the secondary

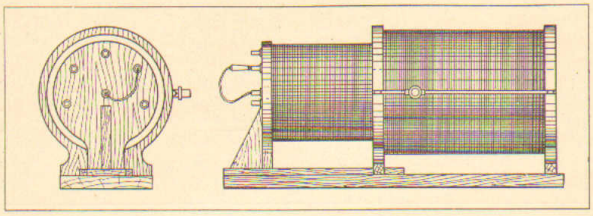


Fig. 3. Elevations of the complete transformer

gives an enlarged view of the end of the instrument showing the primary slider and the plug contact device which varies the inductance of the secondary. Fig. 3 shows side and end elevations of the completed coil.

The details of the primary are given in Fig. 4. The winding is a single layer of No. 24 S.S.C. magnet wire wound evenly upon a cylinder of cardboard. This cylinder is 8 in. in diameter and 11½ in. long. The cardboard cylinder is securely held in two upright wooden pieces cut as shown in the drawing and recessed to take the cylinder as the sectional parts of the drawing indicate. The cylinder may be

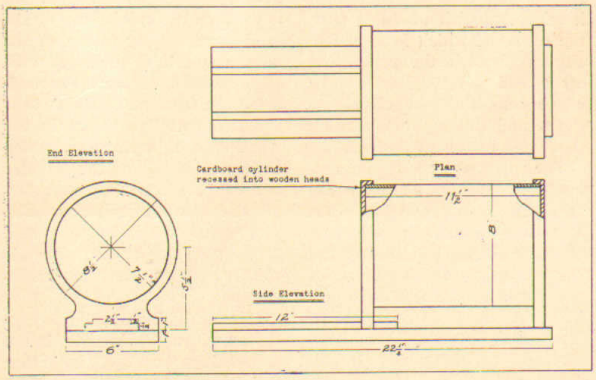


Fig. 4. Details of the primary